

**Practice: 635 - Vegetated Treatment Area****Scenario: #1 - Concrete Curb, with or without flow spreaders****Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into the VTA. The VTA vegetation is harvested to remove nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water.

Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 2.0 ac in size, includes a concrete curb for distribution flow (sheet flow) into the VTA. Usually requires grading and shaping, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Amount of VTA installed

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$7,567.36

**Scenario Cost/Unit:** \$3,783.68

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$69.96	24	\$1,679.04
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	70	\$148.40
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.32	600	\$1,392.00
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-place as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$173.70	7	\$1,215.90
<b>Labor</b>						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$25.79	24	\$618.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.71	20	\$374.20
<b>Materials</b>						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$22.95	70	\$1,606.50
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

**Practice: 635 - Vegetated Treatment Area****Scenario: #2 - Concrete Curb with major shaping****Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into the VTA. The VTA vegetation is harvested to remove nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water.

Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 2.0 ac in size, includes a concrete curb for distribution flow (sheet flow) into the VTA. Typically requires considerable grading and shaping on a small area to maintain sheet flow throughout the VTA (at least 3000 cy/ac). A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Amount of VTA installed

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$22,591.45

**Scenario Cost/Unit:** \$11,295.73

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$3.23	6453	\$20,843.19
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-place as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$173.70	7	\$1,215.90
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

**Practice: 635 - Vegetated Treatment Area****Scenario: #3 - Gated Pipe, with or without flow spreaders****Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water.

Associated

practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 10.0 ac in size, includes a gated irrigation pipe to promote sheet flow through the VTA. Usually requires grading and shaping, gravel spreader trenches to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The establishment of the permanent vegetation within the VTA will be completed under the Critical Area Planting (342) Standard. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Acres in the Treatment Area

**Scenario Unit:** Acre

**Scenario Typical Size:** 10

**Scenario Cost:** \$22,513.76

**Scenario Cost/Unit:** \$2,251.38

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$69.96	24	\$1,679.04
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.32	2800	\$6,496.00
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.24	50	\$62.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$2.12	310	\$657.20
<b>Labor</b>						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$25.79	24	\$618.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$18.71	20	\$374.20
<b>Materials</b>						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$22.95	310	\$7,114.50
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.63	50	\$331.50
Pipe, aluminum, smooth wall gated irrigation, 8"	2029	8" diameter smooth wall gated irrigation aluminum pipe. Material only.	Foot	\$6.64	700	\$4,648.00
<b>Mobilization</b>						

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36
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**Practice: 635 - Vegetated Treatment Area****Scenario: #4 - Gated Pipe with major shaping****Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water.

Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 2 ac in size, includes a gated irrigation pipe to promote sheet flow through the VTA. Typically requires considerable grading and shaping on a small area to maintain sheet flow throughout the VTA (at least 3000 cy/ac). A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The establishment of the permanent vegetation within the VTA will be completed under the Critical Area Planting (342) Standard. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Acres in the Treatment Area

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$22,698.65

**Scenario Cost/Unit:** \$11,349.33

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.24	50	\$62.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$3.23	6453	\$20,843.19
<b>Materials</b>						
Pipe, aluminum, smooth wall gated irrigation, 8"	2029	8" diameter smooth wall gated irrigation aluminum pipe. Material only.	Foot	\$6.64	140	\$929.60
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.63	50	\$331.50
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36

**Practice: 635 - Vegetated Treatment Area****Scenario: #8 - Minor Shaping****Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area or diversion. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water.

Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 2.0 ac in size, includes a shaped vegetated area to promote sheet flow through the VTA. Typically requires grading and shaping to maintain sheet flow throughout the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The establishment of the permanent vegetation within the VTA will be completed under the Critical Area Planting (342) Standard. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Scenario Feature Measure:** Amount of VTA installed

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$2,912.88

**Scenario Cost/Unit:** \$1,456.44

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Motor Grader, 150 HP	1781	Motor Grader or Maintainer, 150 hp. Typical of equipment with HP in range of 130-170. Equipment cost, does not include labor.	Hour	\$103.71	4	\$414.84
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$129.42	12	\$1,553.04
<b>Labor</b>						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$25.79	16	\$412.64
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$266.18	2	\$532.36